User's Manual

The iPORT™ PT1000-ANL Family of Analog Video IP Engines

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1.0 Introduction

1.1 The Scope of this User's Manual

This User's Manual describes how to access and use features specific to Pleora's iPORT PT1000-ANL Family of Analog Video IP Engines. Section 2.2 of this manual provides an overview of the models in this family.

1.2 Related Documents

iPORT PT1000-ANL Analog Video IP Engines are members of Pleora's growing family of iPORT IP Engines. For information about other available engine models, visit www.pleora.com. All the engines share one set of core features, described in a document entitled "User's Manual, Shared Features of iPORT IP Engines."

iPORT PT1000-ANL Analog Video IP Engines are elements of the iPORT Connectivity Solution. As such, they are shipped with two PC applications: the iPORT IP Device Driver; and the iPORT Software Development Kit (SDK – available in C++ or Visual Basic). These software applications have their own documentation.

The iPORT Connectivity Solution also includes the iPORT High Memory Manager, which is described in the iPORT IP Device Drivers manual. As an option, the solution can also include iPORT Hydra™ PC Communications Software, described in the SDK C++ manual.

In summary, this User's Manual complements, and should be used in conjunction with, up to four other documents:

- User's Manual, Shared Features of iPORT IP Engines;
- User's Manual, iPORT IP Device Drivers;
- Reference Manual, The iPORT C++ Software Development Kit; and
- Reference Manual, The iPORT Visual Basic Software Development Kit.

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2.0 Overview of iPORT PT1000-ANL Family

2.1 Highlights

Pleora's iPORT PT1000-ANL Video IP Engines lower the cost, reduce the complexity, extend the reach, and improve the flexibility of analog camera systems for industrial vision and security/surveillance applications.

The engines simultaneously grab and digitize up to two 30-frame/second analog video streams, or up to six multiplexed channels per stream. Using purpose-built hardware, they transfer the video to PCs in real time over GigE links or LANs. All operations are performed at the full, 1-Gb/s line rate and data is never lost.

iPORT Analog Video IP Engines allow analog camera users to – for the first time – tailor frame rates and resolutions at the source to suit application requirements. They accept almost any analog data format, including NTSC/PAL, RS-170/CCIR, SECAM, and progressive scan.

The video is transported over ordinary Cat-5 (Category-5) copper cable. Many buildings are already wired with Cat-5, making installations fast, easy, and economical. In point-to-point connections, the GigE links extend 100 meters with no intervening equipment. With low-cost GigE switches or fiber, users can build scalable, multi-pronged networks that reach much further.

With GigE switches, users can, for example, interconnect multiple cameras, multicast data from one camera to multiple PCs, and distribute image processing across multiple PCs. For security/surveillance, the highly scaleable, PC-based processing approach costs less and is easier to manage and expand than traditional DVR systems.

Most of the iPORT Analog Video IP Engines also handle control signals from the PC and other system elements. These signals are routed through a PLC (programmable logic controller) that allows users to precisely measure and control the operation of conveyors, encoders, cameras, and other components – either independently from or in conjunction with the host PC on the network.

As one element of Pleora's end-to-end iPORT Connectivity Solution, PT1000-ANL engines are shipped with two powerful PC applications. The iPORT IP Device Driver (users can choose from two versions: the iPORT High-Performance IP Device Driver or the iPORT Universal IP Filter Driver) streams data to PC memory using minimal CPU capacity. The iPORT SDK gives users the building blocks needed to quickly and easily enable third-party or custom video applications. The SDK also provides a communications interface that maps the camera command channel through the LAN or link. All commands sent to and received from the camera are transparently routed from/to the host PC via the LAN or link

For more information about the iPORT Connectivity Solution, see the "User's Manual, Shared Features of iPORT IP Engines."

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2.2 Models

To accommodate different needs and budgets, Pleora offers five different iPORT PT1000-ANL Analog Video IP Engine models. Table 1 compares their features. Note that some are available as OEM board sets, some as boxed units, and some as both.

Model	# of 30 f/s Channels	Max # of Cameras Inputs (muxed)	Available Form Factor
PT1000-ANL-2/12-V2	2	12	OEM board set
PT1000-ANL-2/6-V2	2	6	Boxed unit
PT1000-ANL-1/6	1	6	Boxed unit and OEM board set
PT1000-ANL-1/4	1	4	OEM board set
PT1000-ANL-1/2	1	2	Boxed unit

Table 1: iPORT PT1000-ANL Models

Note: The iPORT PT1000-ANL-2/12-V2 and iPORT PT1000-ANL-2/6-V2 are second-generation products, hence the V2 suffix. The first-generation versions of these engines, known simply as the iPORT PT1000-ANL-2/12 and iPORT PT1000-ANL-2/6, are described in the Appendix. These models are not available to new customers and are no longer being upgraded with new features.

2.3 Characteristics and Features

Table 1 to Table 6 list the key characteristics and features of Pleora's five iPORT PT1000-ANL Video IP Engines, one model at a time.

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2.3.1 iPORT PT1000-ANL-2/12-V2 Characteristics and Features

Hardware	
Available as OEM	Yes
Available as Boxed	No
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Inputs/Outputs	
TTL Inputs	2
TTL Outputs	2
Optically Isolated Inputs	1
Optically Isolated Outputs	1
Programmable Logic Control	
Pulse Generators (timers)	4
Rescaler (16-bit)	1
Delayers	1
General Purpose Counters	1
Input Debouncing	Yes
Timestamp Generator	Yes
Timestamp Trigger	Yes
Software Controlled IO	4
GPIO Interrupts FIFO	Yes
Other	
Serial Ports (UART)	1 x RS232 (GPIO)
PT1000-ANL-2/12-V2 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
DHCP	Yes (4.06)
Number of Data Channels	2
Video Sources per Data Channel	6
Video Input	Composite S-Video
Interlaced	Yes
Progressive Scan	Yes, to 30 fps
Area Scan	Yes
Line Scan	NA
Color	NTSC PAL (No: Prog. Scan)
Monochrome	RS170 CCIR
PT1000-ANL-2/12-V2 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8, 10
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720 or 856 (Prog. Scan)
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR), 16,383 (Prog. Scan)
Windowing	Yes
Decimation	Yes
Decimation by Block	Yes
Pixel Inversion	Yes
Recording	Yes

Table 2: iPORT PT1000-ANL2/12-V2 Characteristics and Features

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2.3.2 iPORT PT1000-ANL-2/6-V2 Characteristics and Features

Hardware	
Available as OEM	No
Available as Boxed	Yes
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Inputs/Outputs	
TTL Inputs	2
TTL Outputs	2
Optically Isolated Inputs	1
Optically Isolated Outputs	1
Programmable Logic Control	
Pulse Generators (timers)	4
Rescaler (16-bit)	1
Delayers	1
General Purpose Counters	1
Input Debouncing	Yes
Timestamp Generator	Yes
Timestamp Trigger	Yes
Software Controlled IO	4
GPIO Interrupts FIFO	Yes
Other	
Serial Ports (UART)	1 x RS232 (GPIO)
PT1000-ANL-2/6-V2 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
DHCP	Yes (4.06)
Number of Data Channels	2
Video Sources per Data Channel	3
Video Input	Composite S-Video
Interlaced	Yes
Progressive Scan	Yes, to 30 fps
Area Scan	Yes
Line Scan	NA
Color	NTSC PAL (No: Prog. Scan)
Monochrome	RS170 CCIR
PT1000-ANL-2/6-V2 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8, 10
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720 or 856 (Prog. Scan)
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR), 16,383 (Prog. Scan)
Windowing	Yes
Decimation	Yes
Decimation by Block	Yes
Pixel Inversion	Yes
Recording	Yes

Table 3: iPORT PT1000-ANL2/6-V2 Characteristics and Features

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2.3.3 iPORT PT1000-ANL-1/6 Characteristics and Features

Hardware	
Available as OEM	Yes
Available as Boxed	Yes
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Inputs/Outputs	
TTL Inputs	2
TTL Outputs	2
Optically Isolated Inputs	1
Optically Isolated Outputs	1
Programmable Logic Control	
Pulse Generators (timers)	2
Rescaler (12-bit)	1 (3.50)
Delayers	1 (3.50)
General Purpose Counters	1 (3.50)
Input Debouncing	Yes (3.50)
Timestamp Generator	Yes (3.00)
Timestamp Trigger	Yes (3.50)
Software Controlled IO	4
GPIO Interrupts FIFO	Yes (3.50)
Other	
Serial Ports (UART)	1 x RS232 (GPIO)
PT1000-ANL-1/6 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
Number of Data Channels	1
Video Sources per Data Channel	6
Video Input	Composite S-Video
Interlaced	Yes
Progressive Scan	Yes, to 30 fps (3.25)
Area Scan	Yes
Color	NTSC PAL (No: Prog. Scan)
Monochrome	RS170 CCIR
PT1000-ANL-1/6 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8, 10
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720 or 856 (Prog. Scan)
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR), 16,383 (Prog. Scan)
Windowing	Yes
Decimation	Mono: Yes Color: Yes (3.24)
Decimation by Block	Yes (3.24)
Pixel Inversion	Yes (3.16)
Recording	Yes (3.14)

Table 4: iPORT PT1000-ANL1/6 Characteristics and Features

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2.3.4 iPORT PT1000-ANL-1/2 Characteristics and Features

Hardware	
Available as OEM	No
Available as Boxed	Yes
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Programmable Logic Control	
Timestamp Generator	Yes (3.00)
Other	
Serial Ports (UART)	0
PT1000-ANL-1/2 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
Number of Data Channels	1
Video Sources per Data Channel	2
Video Input	Composite S-Video
Interlaced	Yes
Area Scan	Yes
Color	NTSC PAL
Monochrome	RS170 CCIR
PT1000-ANL-1/2 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR)
Windowing	Yes
Decimation	Mono: Yes Color: Yes (3.24)
Decimation by Block	Yes (3.24)
Pixel Inversion	Yes (3.16)
Recording	Yes (3.14)

Table 5: iPORT PT1000-ANL1/2 Characteristics and Features

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2.3.5 iPORT PT1000-ANL1/4 Characteristics and Features

Hardware	
Available as OEM	Yes
Available as Boxed	No
Onboard Memory	16 MB
Programmable Logic Control	
Timestamp Generator	Yes (3.00)
Other	
PT1000-ANL-1/4 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
Number of Data Channels	1
Video Sources per Data Channel	4
Video Input	Composite S-Video
Interlaced	Yes
Area Scan	Yes
Color	NTSC PAL
Monochrome	RS170 CCIR
PT1000-ANL-1/4 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR)
Windowing	Yes
Decimation	Mono: Yes Color: Yes (3.24)
Decimation by Block	Yes (3.24)
Pixel Inversion	Yes (3.16)
Recording	Yes (3.14)

Table 6: iPORT PT1000-ANL1/4 Characteristics and Features

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3.0 Camera Configuration

To simplify set-up tasks, iPORT PT1000-ANL Video IP Engines and the camera(s) to which they are attached are both configured by the Camera Configuration Dialog of the iPORT SDK. The iPORT PT1000-ANL panels in the dialog are auto-generated by the SDK based on the engine's firmware version and model. This is explained in more detail in the Camera Configuration Dialog section of the "User's Manual, Shared Features of iPORT IP Engines."

The iPORT application is equipped with camera modules for a range of different analog camera models. Check the list in the Select Camera Dialog of the Camera Library Controls. If a camera module is available for your analog camera model, then the Camera Configuration Dialog will auto-generate a panel to control your camera(s). Internally, the camera module converts the controls of that panel to the actual serial port command of the camera.

If no camera-specific module exists for your analog camera model, then you must select the standard analog camera module instead. In this case, you have to find the camera's serial port command information in the camera documentation and type it in the Port Communication Panel.

For more information, read the "User's Manual, Shared Features of iPORT IP Engines," and the CyDeviceExtensionConstants.h file in the "Reference Guide, iPORT C++ Software Development Kit."

Important: If more than one camera is connected to an iPORT PT1000-ANL engine, then both cameras must use the same image properties, such as image size, pixel type, and mode (i.e. progressive scan vs. interlaced). Image settings, such as brightness and contrast, can vary from camera to camera.

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4.0 Connectors

This section describes the power, IO, and video connectors used in iPORT PT1000-ANL Video IP Engines. The Ethernet connectors are all standard RJ-45 plugs.

4.1 OEM Board Set Connectors

Section 2.2 noted that Pleora's family of iPORT PT1000-ANL IP Engines includes three OEM board sets:

- The iPORT PT1000-ANL-2/12-V2 board set;
- The iPORT PT1000-ANL-1/6 board set; and
- The iPORT PT1000-ANL-1/4 board set.

All three board sets use the same types of connectors. Figure 1 shows their location on the boards. The power connector is shown as J2, the IO connector as J45, and the video connector as J48.

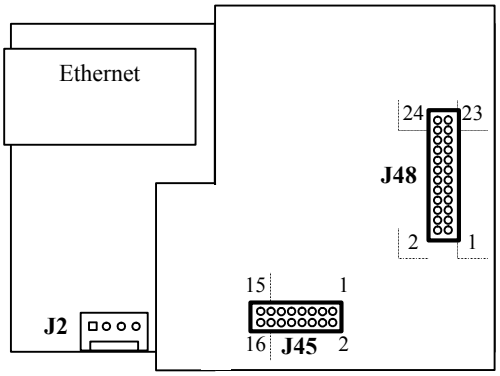

Figure 1: Connectors Locations on OEM Board Sets

Note: The iPORT PT1000-ANL-1/4 board set does not offer PLC capabilities, and thus does not include the IO connector shown as J45.

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4.1.1 Power Connector

iPORT PT1000-ANL OEM board sets accept power supply voltages of from 4.5 V to 16 V (regulated). The power connector is a Molex 4-pin 6373 Series (22-23-2041). The part mates with the Molex 4-pin shell (22-01-3047) and the Molex crimp pin (08-55-0102). Table 7 lists the four pins in the connector and describes the function of each.

Pin	Signal Name	Type	Description
1	GND	PWR	Ground
2	VIN	PWR	Power supply Voltage In (4.5 V to 16 V regulated)
3	VIN	PWR	Power supply Voltage In (4.5 V to 16 V regulated)
4	GND	PWR	Ground

Table 7: Power Connector Pinout for OEM Board Sets

4.1.2 IO Connector

The IO connector used in iPORT PT1000-ANL OEM board sets is a 16-pin, Samtec 2 mm male header (TMM-108-01-G-D-SM). The mating connectors are in the Samtec MMS-108-02-xx-xx series. The mating flat cables are in the Samtec TCSD series (TCSD-08-xxxxxxx). Table 8 lists the 16 pins in the connector and describes the function of each.

Pin	Signal Name	Description
1	GND	Ground
2	VCC	3.3 V at 200 mA max*
3	OPT_OUT-	Optically isolated negative Output
4	OPT_OUT+	Optically isolated positive Output
5	TTL_IN[0]	TTL Input 0
6	TTL_OUT[0]	TTL Output 0
7	TTL_OUT[1]	TTL Output 1
8	TTL_IN[1]	TTL Input 1
9	TTL_OUT[2]	TTL Output 2
10	N/C	Not Connected. Reserved
11	OPT_IN-	Optically isolated negative Input
12	OPT_IN+	Optically isolated positive Input
13	RS232_RX_IN	RS-232 reception Input
14	RS232_TX_OUT	RS-232 transmission Output
15	GND	Ground
16	VCC	3.3 V at 200 mA max*

Table 8: IO Connector Pinout for OEM Board Sets

* These VCC supplies are not recommended for analog circuitry. Analog circuitry should be driven from a separate 3.3 V supply.

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4.1.3 Video Connector

The video connector used by iPORT PT1000-ANL board sets is a Samtec 24-pin 100-mil video header. The part number for this connector is TSW-112-08-L-D-RA. Samtec offers a range of mating parts. One such part is the Samtec ESQ-112-12-G-D. For other options, visit the following Samtec website page:
http://www.samtec.com/technical_specifications/overview.asp?series=TSW

Each board set uses the 24 pins in the connector in a slightly different way. Table 9 describes the function of each pin in the iPORT PT1000-ANL-2/12-V2 board set. Table 10 describes their function in the iPORT PT1000-ANL-1/6, and Table 11 describes their function in the iPORT PT1000-ANL-1/4.

Pin	Signal Name	Description
1	VD1_1	Input 1 of Video Decoder 1
2	GND	Ground
3	VD1_2	Input 2 of Video Decoder 1
4	GND	Ground
5	VD1_3	Input 3 of Video Decoder 1
6	GND	Ground
7	VD1_4	Input 4 of Video Decoder 1
8	GND	Ground
9	VD1_5	Input 5 of Video Decoder 1
10	GND	Ground
11	VD1_6	Input 6 of Video Decoder 1
12	GND	Ground
13	VD0_1	Input 1 of Video Decoder 0
14	GND	Ground
15	VD0_2	Input 2 of Video Decoder 0
16	GND	Ground
17	VD0_3	Input 3 of Video Decoder 0
18	GND	Ground
19	VD0_4	Input 4 of Video Decoder 0
20	GND	Ground
21	VD0_5	Input 5 of Video Decoder 0
22	GND	Ground
23	VD0_6	Input 6 of Video Decoder 0
24	GND	Ground

Table 9: Video Connector Pinout for iPORT PT1000-ANL-2/12-V2 OEM Board Set

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Pin	Signal Name	Description
1	N/C	Not Connected. Reserved
2	N/C	Not Connected. Reserved
3	N/C	Not Connected. Reserved
4	N/C	Not Connected. Reserved
5	N/C	Not Connected. Reserved
6	N/C	Not Connected. Reserved
7	N/C	Not Connected. Reserved
8	N/C	Not Connected. Reserved
9	N/C	Not Connected. Reserved
10	N/C	Not Connected. Reserved
11	N/C	Not Connected. Reserved
12	N/C	Not Connected. Reserved
13	VD0_1	Input 1 of Video Decoder 0
14	GND	Ground
15	VD0_2	Input 2 of Video Decoder 0
16	GND	Ground
17	VD0_3	Input 3 of Video Decoder 0
18	GND	Ground
19	VD0_4	Input 4 of Video Decoder 0
20	GND	Ground
21	VD0_5	Input 5 of Video Decoder 0
22	GND	Ground
23	VD0_6	Input 6 of Video Decoder 0
24	GND	Ground

Table 10: Video Connector Pinout for iPORT PT1000-ANL-1/6 OEM Board Set

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t

Pin	Signal Name	Description
1	VD0_1	Input 1 of Video Decoder 0
2	GND	Ground
3	VD0_2	Input 2 of Video Decoder 0
4	GND	Ground
5	VD0_3	Input 3 of Video Decoder 0
6	GND	Ground
7	VD0_4	Input 4 of Video Decoder 0
8	GND	Ground
9	N/C	Not Connected. Reserved
10	GND	Ground
11	N/C	Not Connected. Reserved
12	GND	Ground
13	N/C	Not Connected. Reserved
14	GND	Ground
15	N/C	Not Connected. Reserved
16	GND	Ground
17	N/C	Not Connected. Reserved
18	GND	Ground
19	N/C	Not Connected. Reserved
20	GND	Ground
21	N/C	Not Connected. Reserved
22	GND	Ground
23	N/C	Not Connected. Reserved
24	GND	Ground

Table 11: Video Connector Pinout for iPORT PT1000-ANL-1/4 OEM Board Set

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4.2 Boxed Connectors

Section 2.2 noted that Pleora's family of iPORT PT1000-ANL IP Engines includes three boxed units:

- The iPORT PT1000-ANL-2/6-V2 boxed unit;
- The iPORT PT1000-ANL-1/6 boxed unit; and
- The iPORT PT1000-ANL-1/2 boxed unit.

All units use the same types of power, IO, and video connectors.

Note: The iPORT PT1000-ANL-1/4 board set does not offer PLC capabilities, and thus does not include the IO connector.

4.2.1 Power Connector

As shown in Figure 2, the power connector used in iPORT PT1000-ANL boxed units is a Hirose 6-pin plug. The part number is HR10A-7R-6P. The mating part number is HR10A-7P-6S. Table 12 lists the six pins on the connector and describes the function of each.

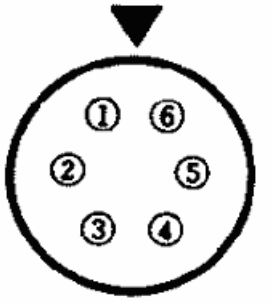

Figure 2: Power Connector for Boxed iPORT PT1000-ANL IP Engines

Pin	Description
1	VIN 4.5 V to 16 V regulated
2	VIN 4.5 V to 16 V regulated
3	VIN 4.5 V to 16 V regulated
4	Ground
5	Ground
6	Ground

Table 12: Power Connector Pinout for Boxed Engines

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4.2.2 IO Connector

The IO connector on iPORT PT1000-ANL boxed units is a Hirose 12-pin plug. The part number is HR10A-10R-12S. The mating part number is HR10A-10P-12P. Table 13 lists the 12 pins in the connector and describes the function of each.

Note: The iPORT PT1000-ANL-1/4 board set does not have an on-board IO port, and thus does not include the IO connector.

Pin	Signal Name	Description
1	OPT0_OUT-	Optically isolated negative Output
2	OPT0_OUT+	Optically isolated positive Output
3	TTL_IN[0]	TTL Input 0
4	TTL_OUT[0]	TTL Output 0
5	TTL_OUT[1]	TTL Output 1
6	TTL_IN[1]	TTL Input 1
7	OPT0_IN-	Optically isolated negative Input
8	OPT0_IN+	Optically isolated positive Input
9	RS232_RX	Serial port Reception
10	RS232_TX	Serial port Transmission
11	GND	Ground
12	VCC	3.3 V at 100 mA max

Table 13: IO Connector Pinout for Boxed Units

4.2.3 Video Connectors

The video connectors used on iPORT PT1000-ANL boxed units are BNC connectors. The ANL-1/6 and ANL-2/6-V2 units have six BNC connectors. The ANL-1/2 has two BNC connectors.

Figure 3 shows the location and numbering scheme of the six BNC connectors on the ANL-1/6 and Table 14 describes the function of each.

Figure 4 shows the location and numbering scheme of the six BNC connectors on the ANL-2/6 and Table 15 describes the function of each.

Figure 5 shows the location of the two BNC connectors on the ANL-1/2 and Table 16 describes the function of each.

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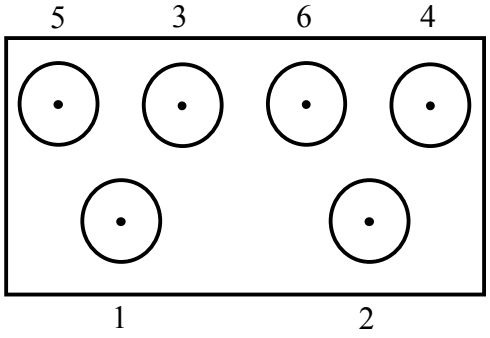

Figure 3: Video Connectors on Boxed iPORT PT1000-ANL-1/6

Pin	Description
1	Input 1 of video decoder 0
2	Input 2 of video decoder 0
3	Input 3 of video decoder 0
4	Input 4 of video decoder 0
5	Input 5 of video decoder 0
6	Input 6 of video decoder 0

Table 14: Video Connector Pinout for Boxed iPORT PT1000-ANL-1/6

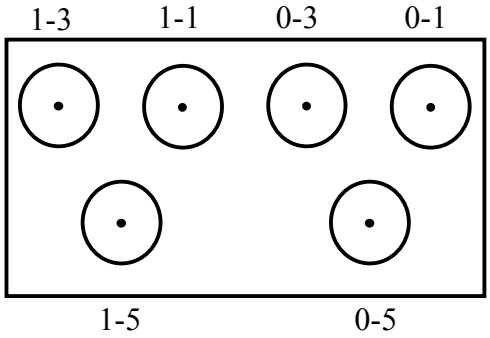

Figure 4: Video Connectors on Boxed iPORT PT1000-ANL-2/6-V2

Pin	Description
0-1	Input 1 of video decoder 0
0-3	Input 3 of video decoder 0
0-5	Input 5 of video decoder 0
1-1	Input 1 of video decoder 1
1-3	Input 3 of video decoder 1
1-5	Input 5 of video decoder 1

Table 15: Video Connector Pinout for Boxed iPORT PT1000-ANL-2/6-V2

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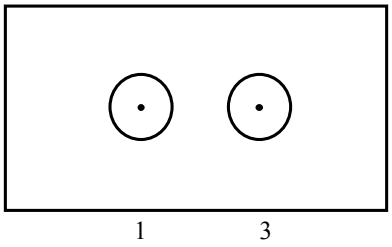

Figure 5: Video Connectors on Boxed iPORT PT1000-ANL-1/2

Pin	Description
1	Input 1 of video decoder 0
3	Input 3 of video decoder 0

Table 16: Video Connector Pinout for Boxed iPORT PT1000-ANL-1/2

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5.0 Signal Handling

iPORT Analog Video IP engines handle the signals in much the same way as other iPORT IP engine models. There are a few minor differences, which are described in this section.

5.1 GPIO Control Blocks

The iPORT PT1000-ANL-2/12-V2, the iPORT PT1000-ANL-2/6-V2, and the iPORT PT1000-ANL-1/6 feature a Programmable Logic Controller (PLC) that routes signals through a sophisticated GPIO Control Block. The two low-density analog video IP engines – the PT1000-ANL-1/2 and PT1000-ANL-1/4 – do not offer a PLC capability and thus do not have a GPIO Control Block.

Figure 6 shows the GPIO Control Block used in the boxed and OEM versions of the iPORT PT1000-ANL-1/6 engine. Note that the third TTL output, TTL_OUT[2], is not available in the boxed version.

Figure 7 shows the GPIO Control Block used in the iPORT PT1000-ANL-2/6-V2 engine (offer only as a boxed unit) and the iPORT PT1000-ANL-2/12-V2 engine (offered only as an OEM board set).

For further details on how the engines handle IO signals, see the “User’s Manual, Shared Features of iPORT IP Engines.”

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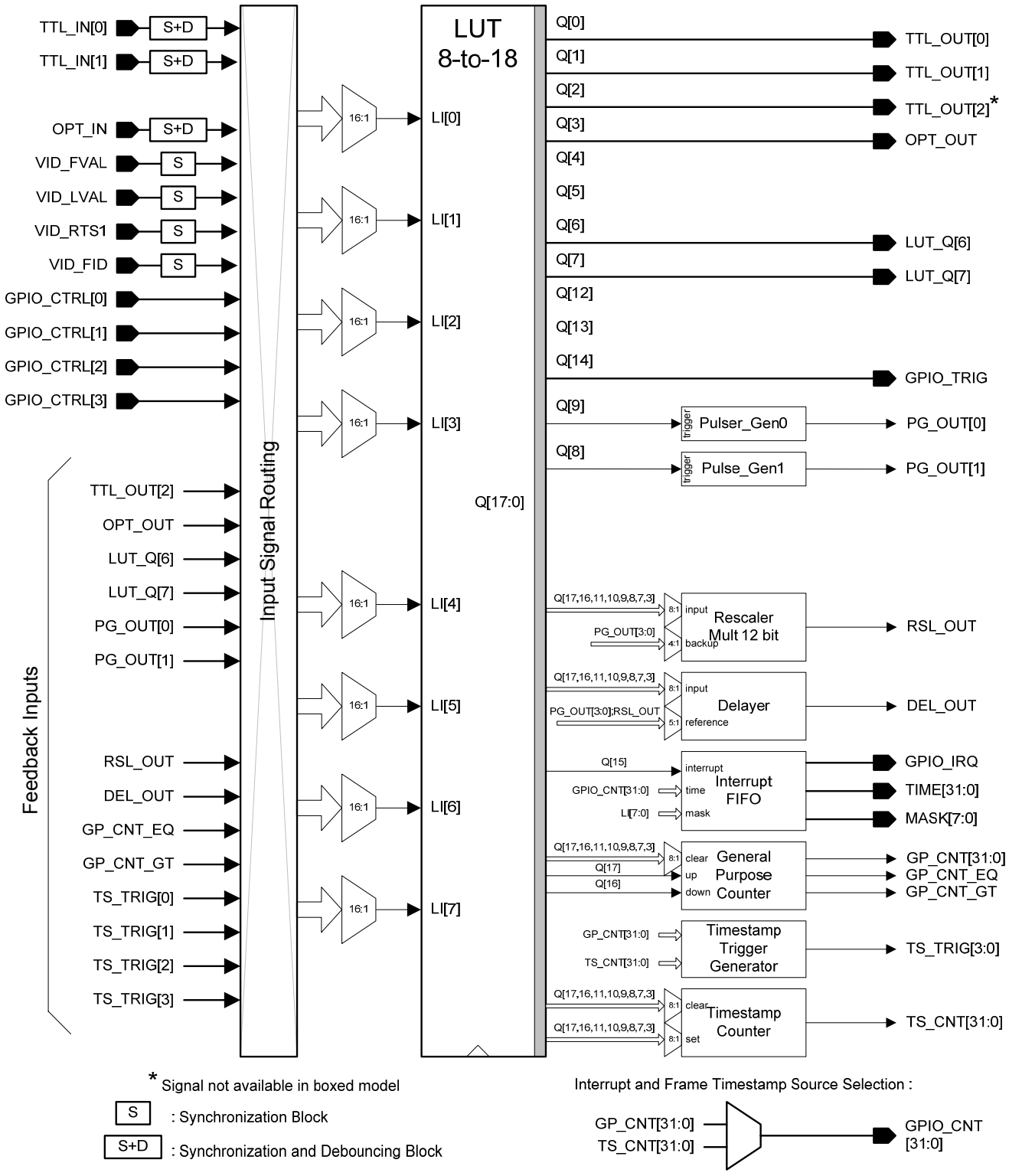

Figure 6: GPIO Control Block for iPORT PT1000-ANL-1/6

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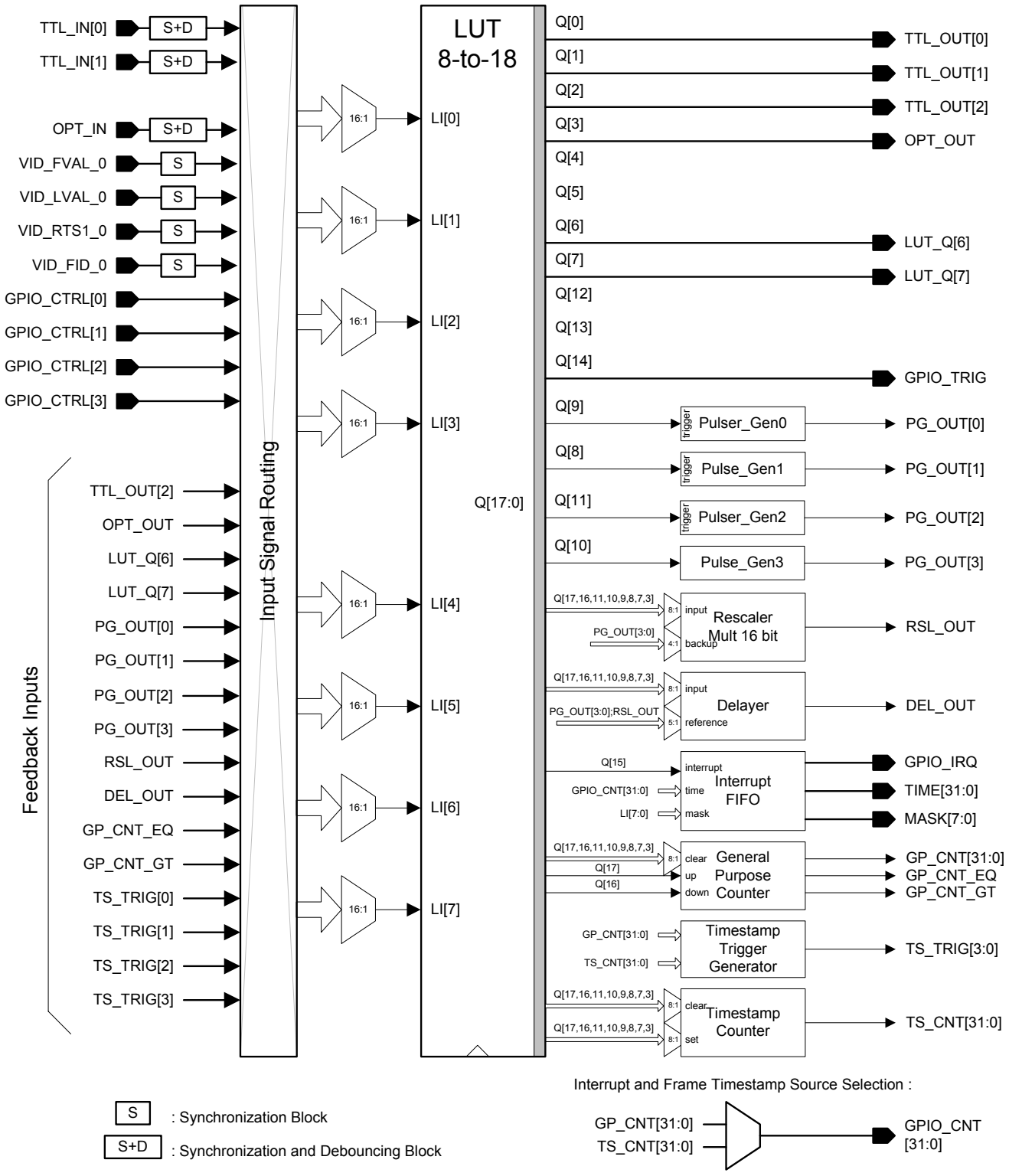

Figure 7: GPIO Control Block for iPORT PT1000-ANL-2/6-V2 and ANL-2/12-V2

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5.2 GPIO Programming Signals

Table 17 lists GPIO input programming signals specific to iPORT PT1000-ANL IP engines. The labels for these signals in the GPIO Look-Up Table depend on the input configured in the GPIO Look-Up Table dialog in the iPORT SDK.

Table 18 lists the output programming signals, as well as their labels in the GPIO Look-Up Table.

Refer to the "User's Manual, Shared Features of iPORT IP Engines" for details about other GPIO programming signals used by the engines.

Input Signal	Model	Description
TTL_IN[0]	ANL-1/6, ANL-2/6, and ANL-2/12	TTL input 0
TTL_IN[1]	ANL-1/6, ANL-2/6, and ANL-2/12	TTL input 1
OPTO_IN	ANL-1/6, ANL-2/6, and ANL-2/12	Optically isolated input
VID_FVAL	ANL-1/6	Video Frame Valid Signal
VID_LVAL	ANL-1/6	Video Line Valid Signal
VID_RTS1	ANL-1/6	Video Real Time Status 1
VID_FID	ANL-1/6	Video Field Indicator
VID_FVAL_0	ANL-2/6 and ANL-2/12	Channel 0 Frame Valid signal
VID_LVAL_0	ANL-2/6 and ANL-2/12	Channel 0 Line Valid signal
VID_RTS1_0	ANL-2/6 and ANL-2/12	Channel 0 Video Real Time Status 1
VID_FID_0	ANL-2/6 and ANL-2/12	Channel 0 Video Field Indicator

Table 17: iPORT PT1000-ANL GPIO Input Signals

Output Signal	Label	Description
TTL_OUT[0]	Q0	TTL output 0
TTL_OUT[1]	Q1	TTL output 1
TTL_OUT[2]	Q2	TTL output 2 (not available in boxed ANL-1/6)
OPT_OUT	Q3	Optically isolated output
LUT_Q[6]	Q6	Feedback into GPIO Look-Up Table on output 6
LUT_Q[7]	Q7	Feedback into GPIO Look-Up Table on output 7

Table 18: iPORT PT1000-ANL GPIO Output Signals

5.3 Camera Interface

5.3.1 Camera Inputs

The video decoder chips used in iPORT ANL IP engines all provide the following synchronization signals: Video Frame Valid (FVAL); Video Line Valid (LVAL); Video Real-Time Status 1 (RTS1); and Video Field Indicator (FID). The names for these signals in the GPIO Control Block programming language are: VID_FVAL, VID_LVAL, VID_RTS1, and VID_FID.

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6.0 Mechanical Dimensions

This section provides mechanical drawings and measurements of the OEM and boxed versions of the iPORT PT1000-ANL Family of Video IP Engines. The measurements are in inches unless otherwise noted. The measurements have the following tolerances, depending on the number of significant digits provided:

.X	±0.1
.XX	±0.01
.XXX	±0.005

6.1 Drawings of OEM Board Sets

6.1.1 iPORT PT1000-ANL-1/4 Drawings

Figure 8 to Figure 10 show the isometric, side view, and top view of the iPORT PT1000-ANL-1/4 OEM board set.

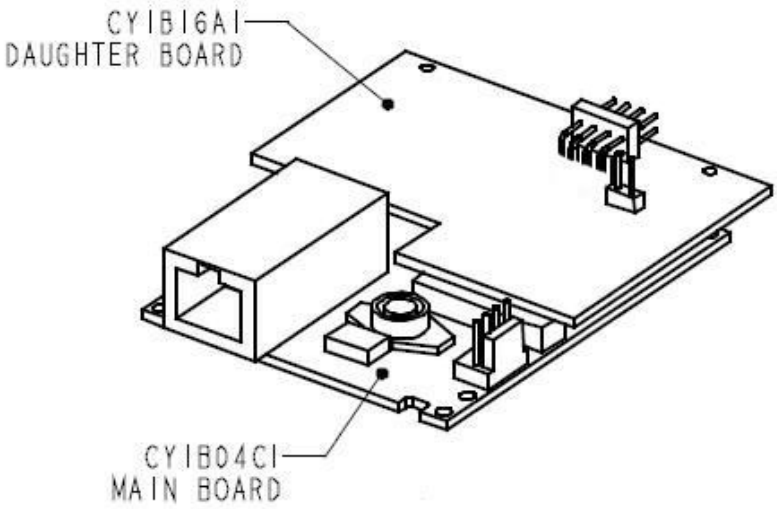

Figure 8: Isometric View of ANL-1/4 OEM Board Set

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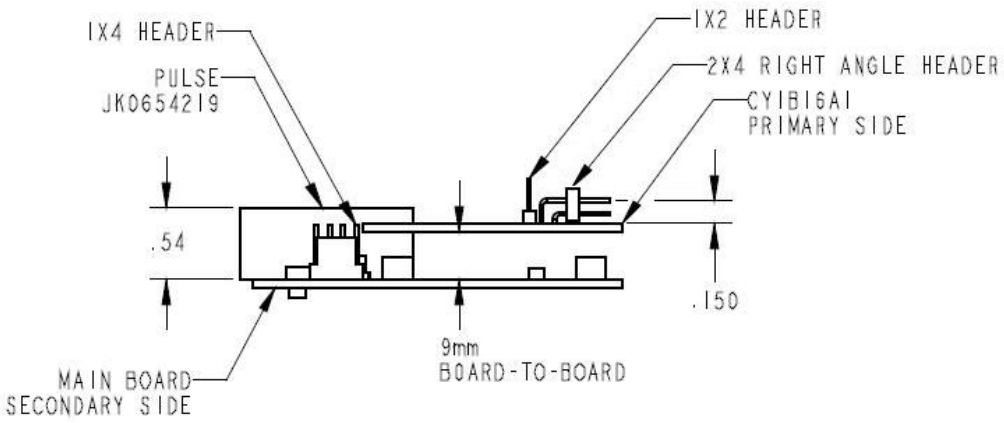

Figure 9: Side View of ANL-1/4 OEM Board Set

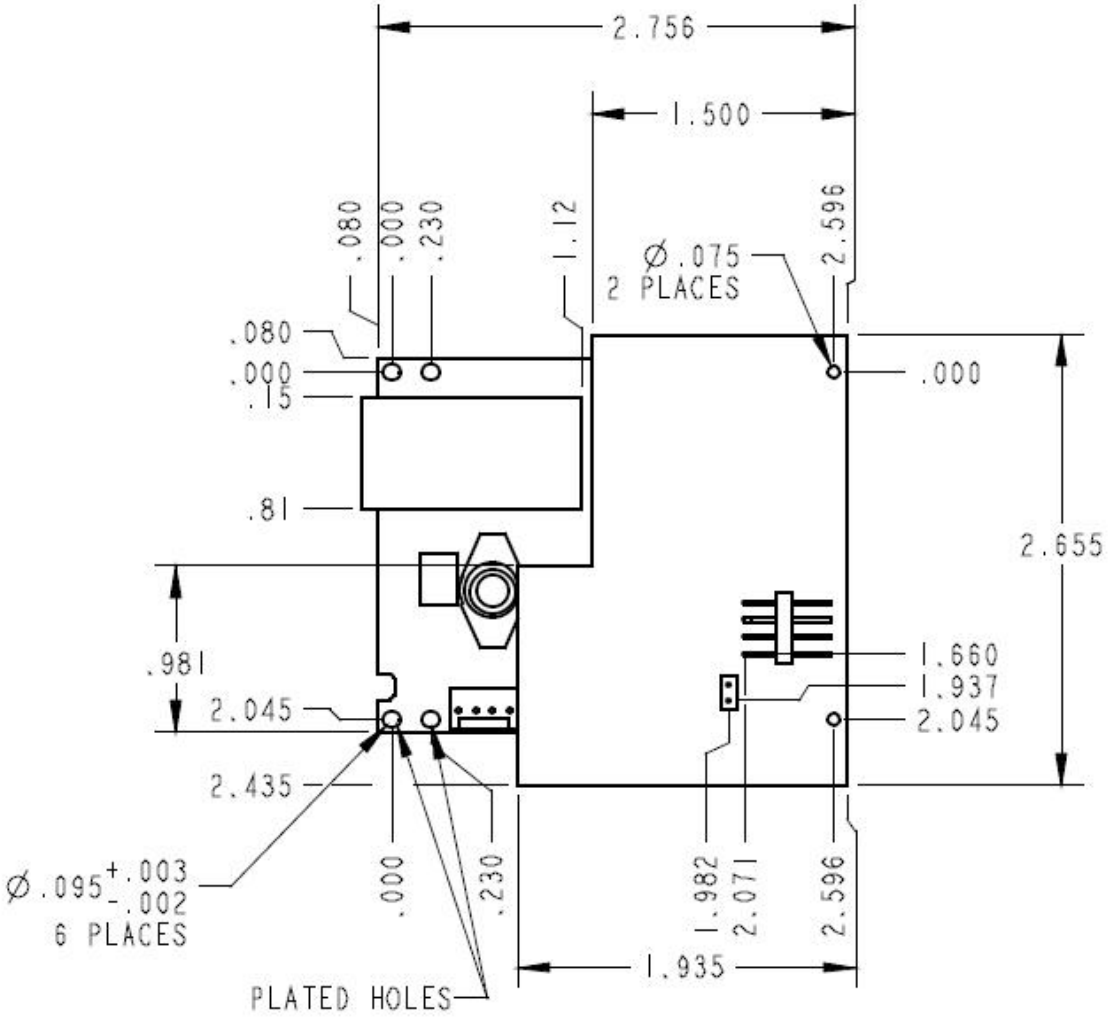

Figure 10: Top View of ANL-1/4 OEM Board Set

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6.1.2 iPORT PT1000-ANL-1/6 Drawings

Figure 11 to Figure 13 show the isometric, side view, and top view of the iPORT PT1000-ANL-1/6 OEM board set.

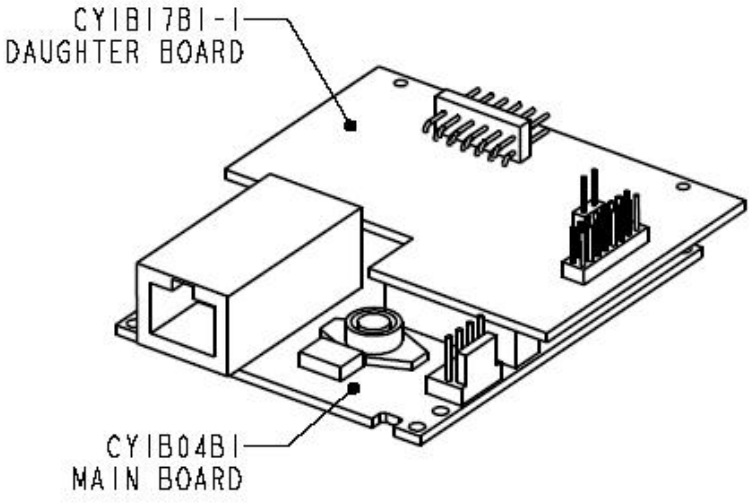

Figure 11: Isometric View of ANL-1/6 OEM Board Set

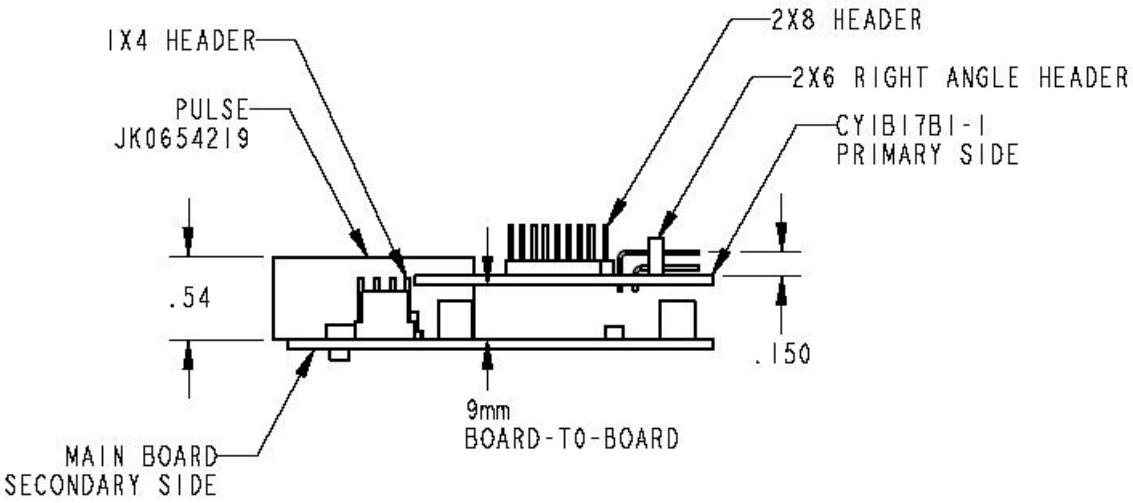

Figure 12: Side View of ANL-1/6 OEM Board Set

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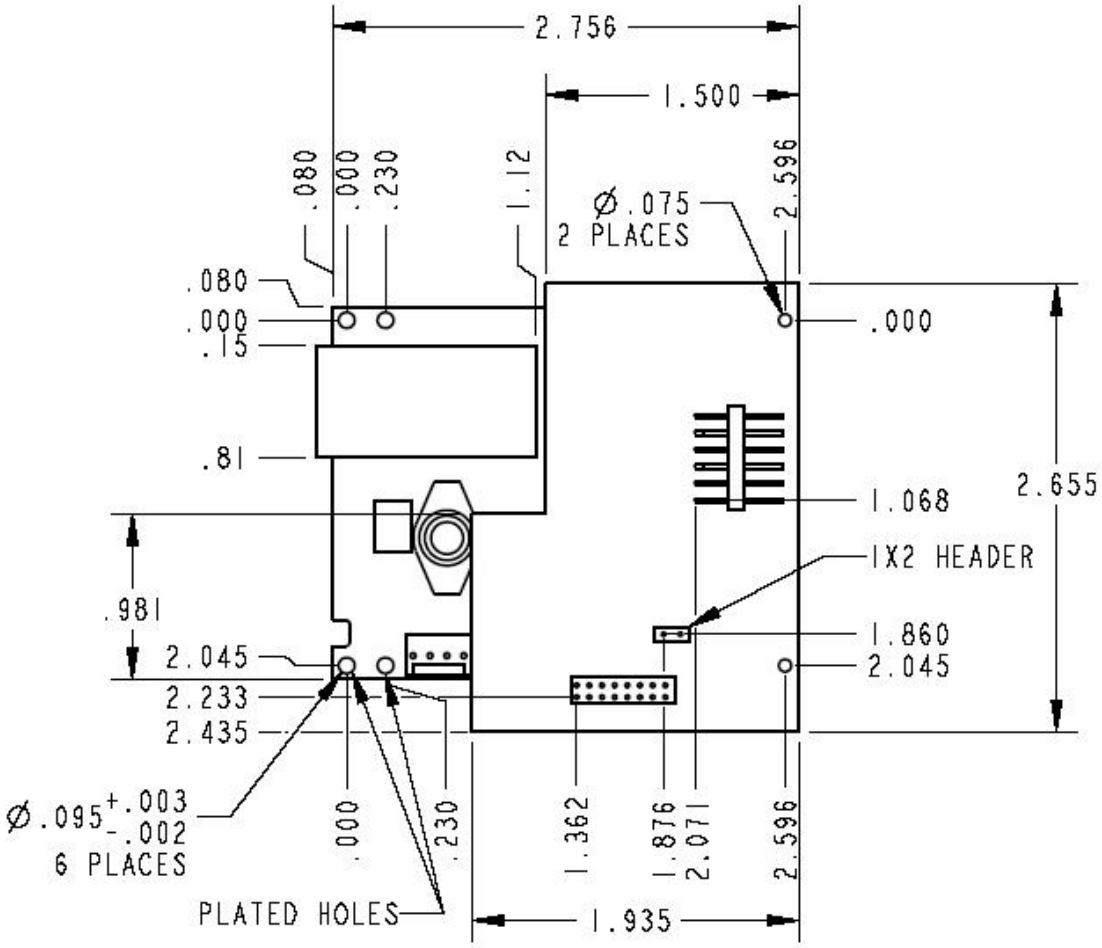

Figure 13: Top View of ANL-1/6 OEM Board Set

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6.1.3 iPORT PT1000-ANL-2/12-V2 Drawings

Figure 14 to Figure 16 show the isometric, side view, and top view of the iPORT PT1000-ANL-2/12-V2 OEM board set.

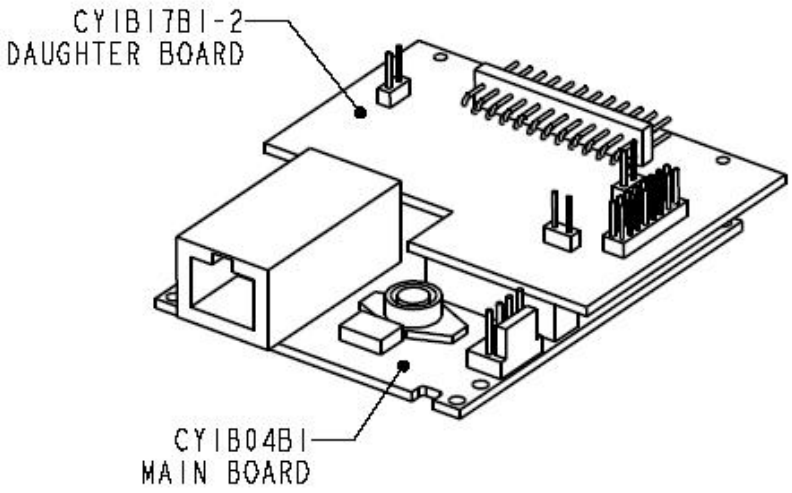

Figure 14: Isometric View of ANL-2/12-V2 OEM Board Set

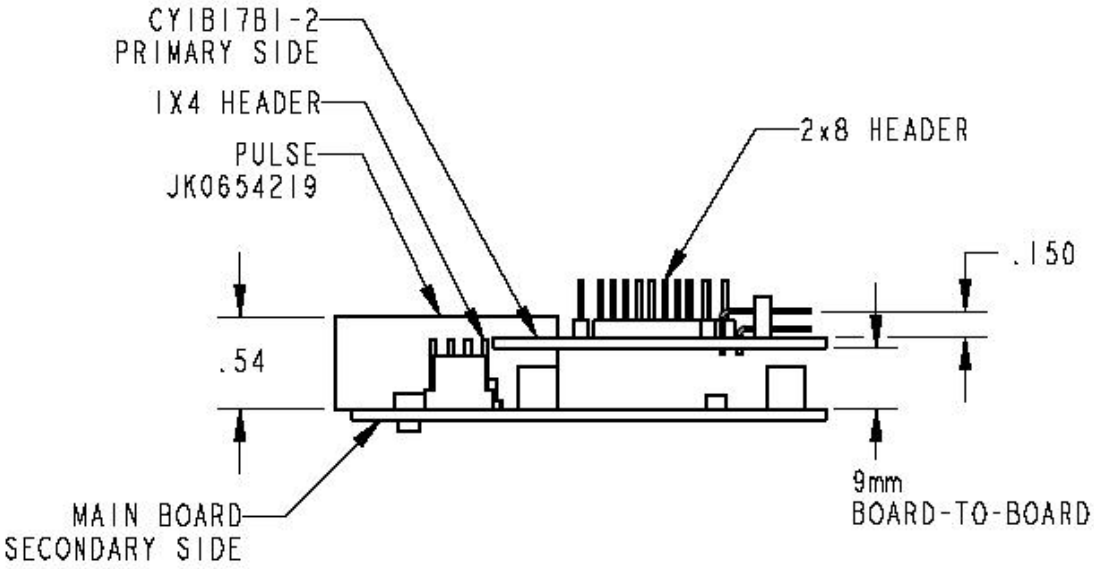

Figure 15: Side View of ANL-2/12-V2 OEM Board Set

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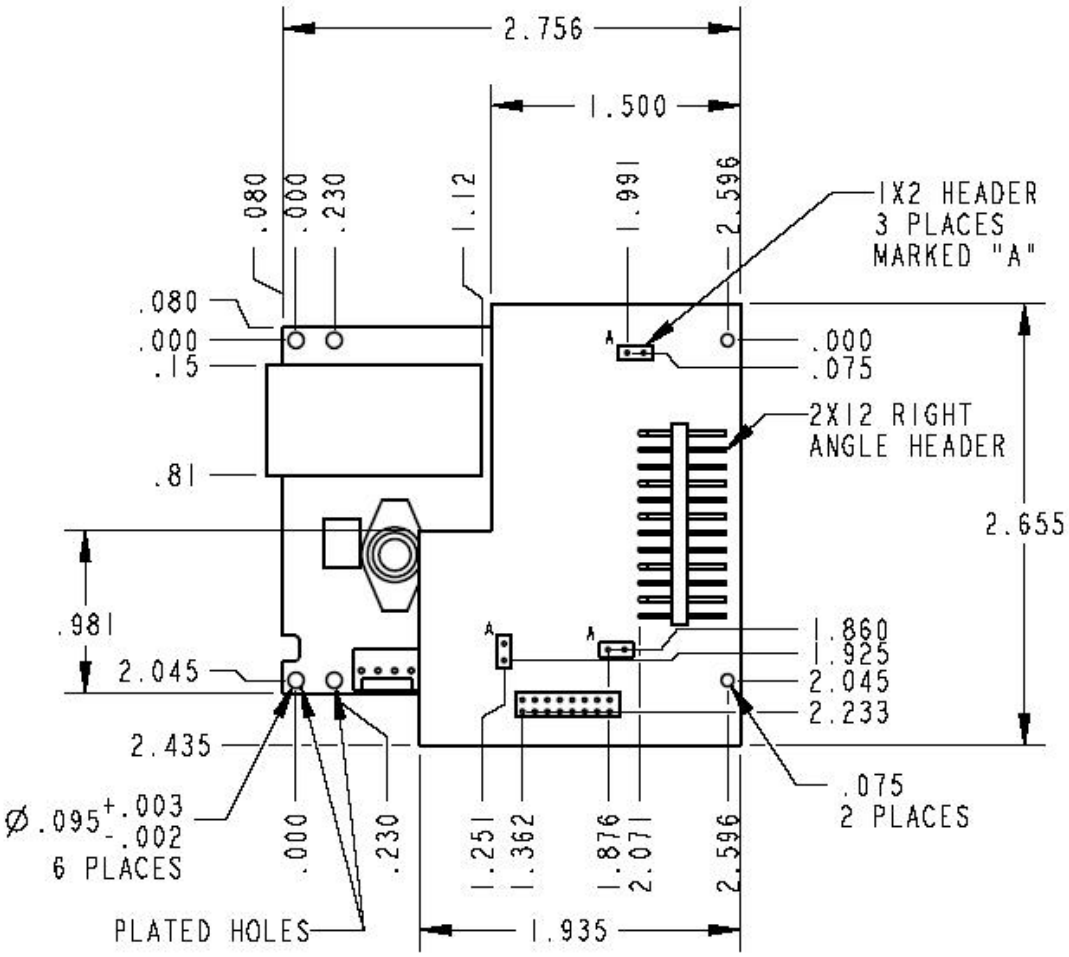

Figure 16: Top View of ANL-2/12-V2 OEM Board Set

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6.2 Drawings of Boxed Units

In all boxed units, the mounting hole diameter and slot width are both 0.17 +/- 0.01 inches.

6.2.1 iPORT PT1000-ANL-1/2 Drawings

Figure 17 to Figure 20 show the front, rear, side, and top views of the iPORT PT1000-ANL-1/2 boxed unit.

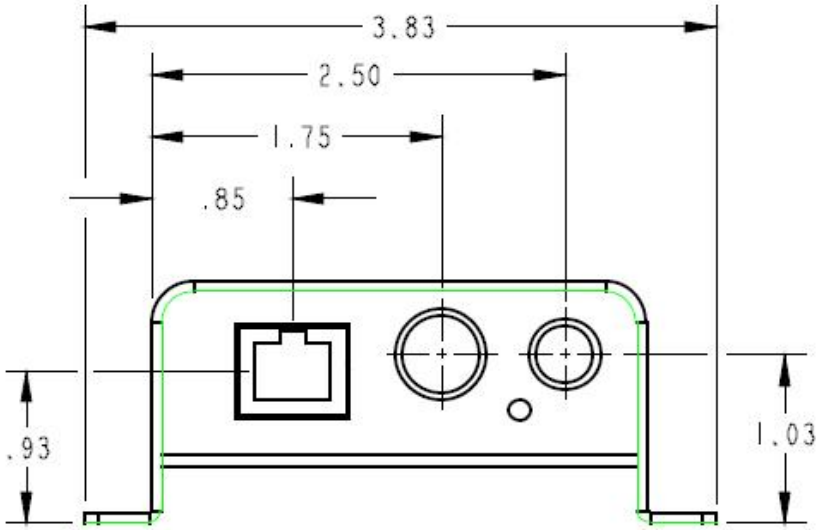

Figure 17: Front View of ANL-1/2 Boxed Unit

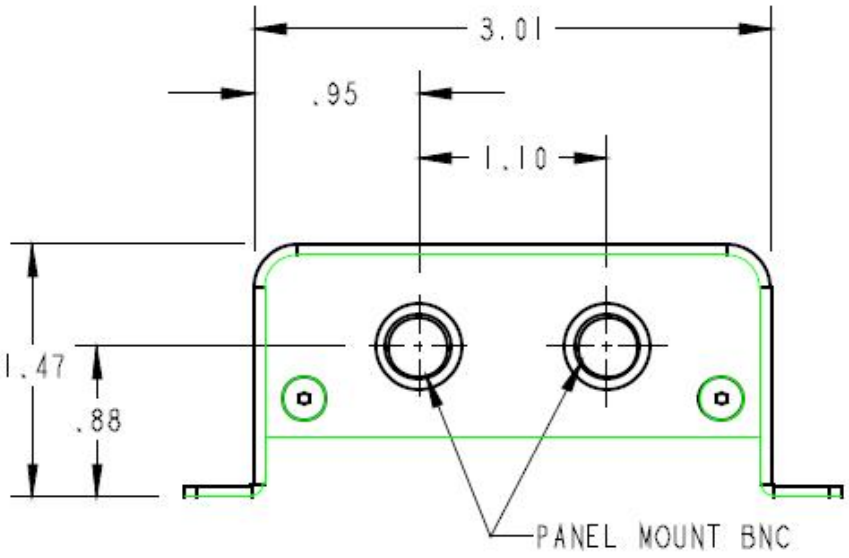

Figure 18: Rear View of ANL-1/2 Boxed Unit

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Figure 19: Side View of ANL-1/2 Boxed Unit

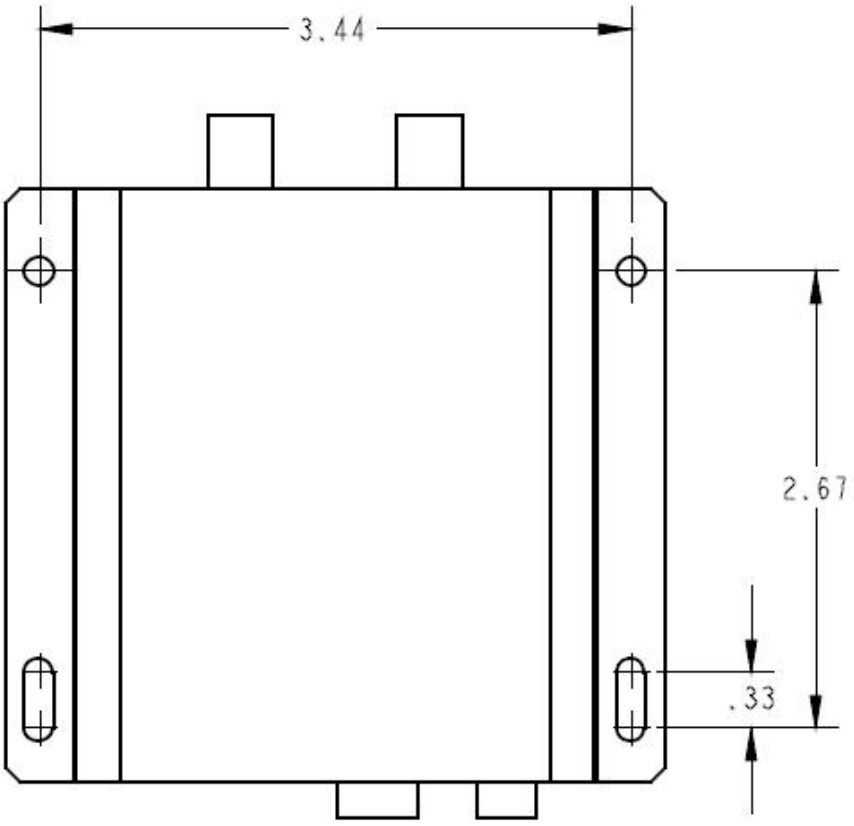

Figure 20: Top View of ANL-1/2 Boxed Unit

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6.2.2 iPORT PT1000-ANL-2/6-V2 and ANL-1/6 Drawings

Figure 21 to Figure 24 show the front, rear, side, and top views of the iPORT PT1000-ANL-2/6-V2 and ANL-1/6 boxed units.

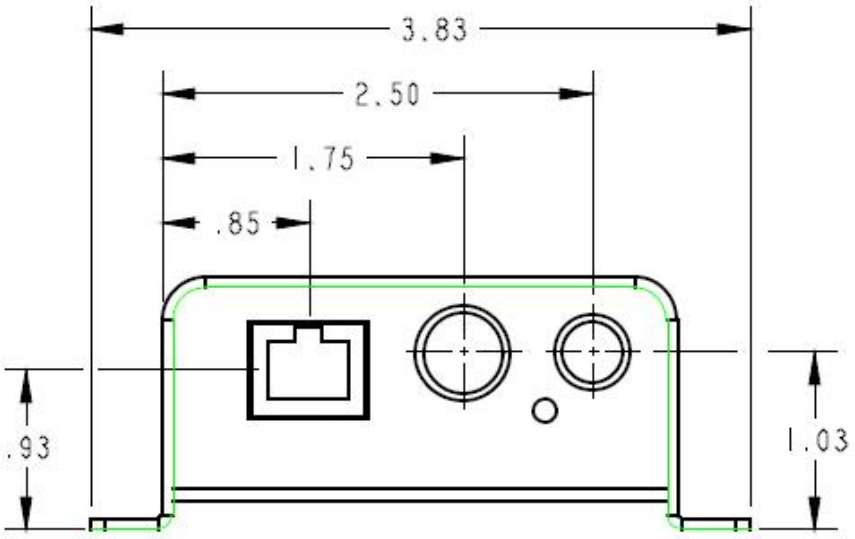

Figure 21: Front View of ANL-2/6-V2 and ANL-1/6 Boxed Units

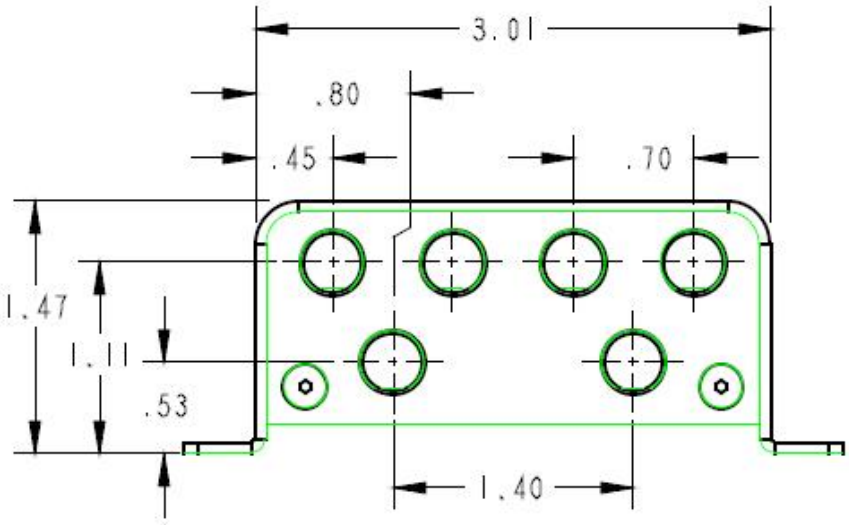

Figure 22: Rear View of ANL-2/6-V2 and ANL-1/6 Boxed Units

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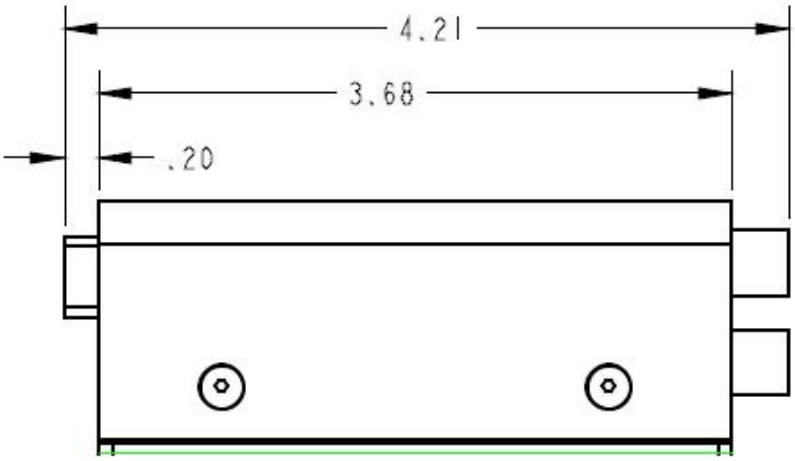

Figure 23: Side View of ANL-2/6-V2 and ANL-1/6 Boxed Units

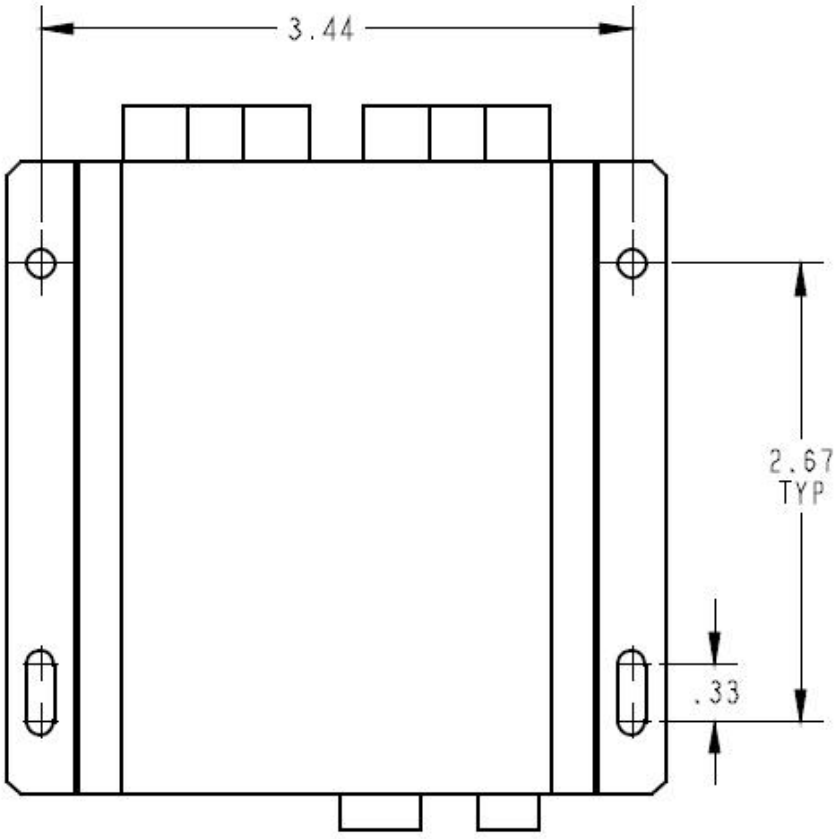

Figure 24: Top View of ANL-2/6-V2 and ANL-1/6 Boxed Units

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7.0 Additional Support

Additional support can be obtained by contacting Applications Support at Pleora Technologies Inc. at (613) 270-0625 or via email at support@pleora.com.

7.1 Revision History

Revision	Date	Description
2.1.2	February 2003	- Creation
2.1.3	November 2004	- Modified text to reflect iPORT Software V2.1.3
060206	February 2006	- Modified text to reflect iPORT Software V2.2.0 - Added Characteristics and Features table - Added OEM mechanical drawings - Reordered sections - Updated formatting to comply with new Pleora template - Added Revision History table - Added Appendix for legacy ANL products

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8.0 Appendix: Legacy Models

This appendix is a brief overview of the features and GPIO block in the first-generation the iPORT PT1000-ANL-2/6 and iPORT PT1000-ANL-2/12 IP Engines. These models are not available to new customers and are no longer being upgraded with new features. Table 19 and Table 20 list key characteristics and features of these models and Figure 25 shows their GPIO Control Block.

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8.1 Characteristics and Features

Hardware	
Available as OEM	No
Available as Boxed	Yes
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Inputs/Outputs	
TTL Inputs	2
TTL Outputs	2
Optically Isolated Inputs	1
Optically Isolated Outputs	1
Programmable Logic Control	
Pulse Generators (timers)	2
Delayers	0
General Purpose Counters	0
Input Debouncing	No
Timestamp Generator	Yes (3.00)
Software Controlled IO	4
GPIO Interrupts FIFO	Yes (3.50)
Other	
Serial Ports (UART)	1 x RS232 (GPIO)
PT1000-ANL-2/6 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable

* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
Number of Data Channels	2
Video Sources per Data Channel	3
Video Input	Composite S-Video
Interlaced	Yes
Progressive Scan	Yes, to 30 fps (3.25)
Area Scan	Yes
Color	NTSC PAL (No: Prog. Scan)
Monochrome	RS170 CCIR
PT1000-ANL-2/6 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8, 10
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720 or 856 (Prog. Scan)
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR), 16,383 (Prog. Scan)
Windowing	Yes
Decimation	Mono: Yes Color: Yes (3.24)
Decimation by Block	Yes (3.24)
Pixel Inversion	Yes (3.16)
Recording	Yes (3.27)

Table 19: iPORT PT1000-ANL-2/6 Characteristics and Features

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Hardware	
Available as OEM	Yes
Available as Boxed	No
Onboard Memory	16 MB (Std) 64 MB (Opt) 128 MB (Opt)
Inputs/Outputs	
TTL Inputs	2
TTL Outputs	2
Optically Isolated Inputs	1
Optically Isolated Outputs	1
Programmable Logic Control	
Pulse Generators (timers)	2
Delayers	0
General Purpose Counters	0
Input Debouncing	No
Timestamp Generator	Yes (3.00)
Software Controlled IO	4
GPIO Interrupts FIFO	Yes (3.50)
Other	
Serial Ports (UART)	1 x RS232 (GPIO)
PT1000-ANL-2/12 Supply Voltage	Min: 4.5 V Typ: 5 V Max: 16 V
Power Consumption (measured at 10V)	Typ: 2.5 W Max: 2.5 W
Operating Temperature	Min: 0 °C Max: 70 °C
Storage Temperature	Min: -40 °C Max: 125 °C

Notes:
(x.xx) - Available since firmware version x.xx
NA - Not applicable
* All features supported by iPORT S/W 2.2.0

Frame Grabber	
Ethernet Bandwidth	1 Gb/s
Unicast	Yes
Multicast	Yes
BOOTP	Yes
Number of Data Channels	2
Video Sources per Data Channel	6
Video Input	Composite S-Video
Interlaced	Yes
Progressive Scan	Yes, to 30 fps (3.25)
Area Scan	Yes
Line Scan	NA
Color	NTSC PAL (No: Prog. Scan)
Monochrome	RS170 CCIR
PT1000-ANL-2/12 Data Output Formats	Grayscale YUV 4:2:2
Pixel Depth (bits)	8, 10
Pixel Clock	13.5 MHz
Taps per Data Channel	1
Image Width (pixels) (must be multiple of 4)	Min: 4 Default: 720 Max: 720 or 856 (Prog. Scan)
Image Height (pixels)	Min: 1 Def: 480 (NTSC/RS170), 576 (PAL/CCIR) Max: 520 (NTSC/RS170), 616 (PAL/CCIR), 16,383 (Prog. Scan)
Windowing	Yes
Decimation	Mono: Yes Color: Yes (3.24)
Decimation by Block	Yes (3.24)
Pixel Inversion	Yes (3.16)
Recording	Yes (3.27)

Table 20: iPORT PT1000-ANL-2/12 Characteristics and Features

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8.2 GPIO Control Block

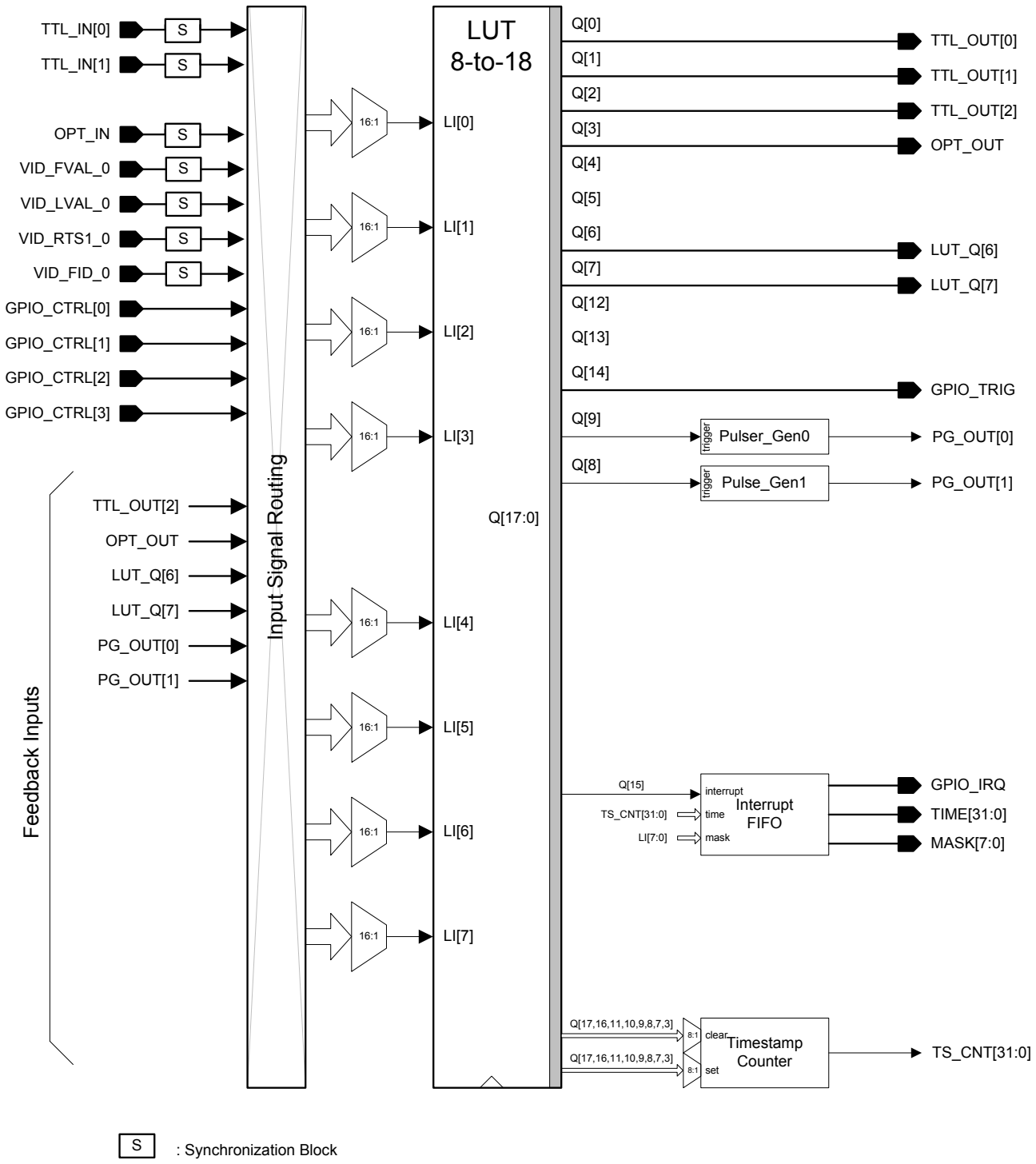

Figure 25: First-Generation iPORT PT1000-ANL-2/6, -2/12 GPIO Control Block

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